EBERLINE
SERVICES

July 10, 2002

Ms. Joan Kessner
Bechtel Hanford Inc.
3350 George Washington Way
Richland, WA 99352
MSIN: H0-25

Reference: **P.O. #630**
Eberline Services R2-05-121-7284, SDG H1788

Dear Ms. Kessner:

Enclosed is the data report one solid sample designated under SAF No. B02-050 received at Eberline Services on May 22, 2002. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

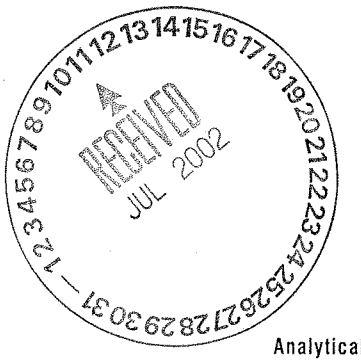
Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package



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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1788 was composed of one solid (soil) sample designated under SAF No. B02-050 with a Project Designation of: 216-Z-11 Ditch Borehole Samples. The sample in SDG H1788 (Group 7284) was batched with the sample in SDG H1779 (Group 7278).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The matrix spike was associated with SDG H1779 (Group 7278). The matrix spike percent recovery was 90%. No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-239 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

The LCS had a yield of 106% slightly above the laboratory protocol limits (20 to 105%). No other problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.9 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.10 Transplutonic Analyses (Am-241 and Cm-243/244)

No problems were encountered during the course of the analyses.

2.11 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion

Melissa C. Mannion
Program Manager

7/10/02

Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H1788

SDG	7284
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG_H1788

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	07/10/02

SDG 7284
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1788

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/10/02

SDG 7284
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1788

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1788

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B14KC7	200 W	SOLID		R205121-01	B02-050	B02-050-27	05/17/02 11:05
Method Blank		SOLID		R205097-03	B02-050		
Lab Control Sample		SOLID		R205097-02	B02-050		
Duplicate (R205121-01)	200 W	SOLID		R205121-02	B02-050		05/17/02 11:05

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

QC SUMMARY

SDG 7284
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1788

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7278		Method Blank	SOLID						R205097-03	7278-003
		Lab Control Sample	SOLID						R205097-02	7278-002
7284	B02-050-27	B14KC7	SOLID	92.0	1745 g		05/22/02	5	R205121-01	7284-001
		Duplicate (R205121-01)	SOLID	92.0	1745 g		05/22/02	5	R205121-02	7284-002

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

PREP BATCH SUMMARY

SDG 7284
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1788

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
NP	SOLID	Neptunium in Soil	7036-049	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7036-049	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7036-049	5.0	1			1	1	1/1		
TP	SOLID	Americium 241/Curium in Solids	7036-049	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	7036-049	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7036-049	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7036-049	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7036-049	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7036-049	10.0	1			1	1	1/1		
H	SOLID	Tritium in Soil	7036-049	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	7036-049	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1788

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B14KC7			R205121-01	7284-001	C		06/29/02	07/10/02	MCM	Carbon 14 in Soil
200 W		SOLID	05/17/02	7284-001	GAM		07/02/02	07/10/02	MCM	Gamma Scan
B02-050-27	B02-050		05/22/02	7284-001	H		07/02/02	07/10/02	MCM	Tritium in Soil
				7284-001	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7284-001	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7284-001	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7284-001	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7284-001	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7284-001	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7284-001	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7284-001	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil
Method Blank			R205097-03	7278-003	C		06/28/02	07/10/02	MCM	Carbon 14 in Soil
		SOLID		7278-003	GAM		07/02/02	07/10/02	MCM	Gamma Scan
	B02-050			7278-003	H		07/02/02	07/10/02	MCM	Tritium in Soil
				7278-003	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7278-003	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7278-003	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7278-003	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7278-003	TC		07/01/02	07/10/02	MCM	Technetium 99 in Soil
				7278-003	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7278-003	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7278-003	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R205097-02	7278-002	C		06/29/02	07/10/02	MCM	Carbon 14 in Soil
		SOLID		7278-002	GAM		07/02/02	07/10/02	MCM	Gamma Scan
	B02-050			7278-002	H		07/01/02	07/10/02	MCM	Tritium in Soil
				7278-002	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7278-002	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7278-002	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7278-002	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7278-002	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7278-002	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7278-002	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7278-002	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/10/02

SDG 7284
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1788

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R205121-01)			R205121-02	7284-002	C		06/29/02	07/10/02	MCM	Carbon 14 in Soil
200 W		SOLID	05/17/02	7284-002	GAM		07/03/02	07/10/02	MCM	Gamma Scan
	B02-050		05/22/02	7284-002	H		07/02/02	07/10/02	MCM	Tritium in Soil
				7284-002	NI_L		07/04/02	07/10/02	MCM	Nickel 63 in Soil
				7284-002	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7284-002	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7284-002	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7284-002	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7284-002	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7284-002	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7284-002	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	B02-050	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	B02-050	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	B02-050	Tritium in Soil	906.0_H3_LSC	1			1	1	1	4
NI_L	B02-050	Nickel 63 in Soil	NI63_LSC	1			1	1	1	4
NP	B02-050	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B02-050	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B02-050	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	B02-050	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1	4
TH	B02-050	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	B02-050	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U	B02-050	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1	4
TOTALS				11			11	11	11	44

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1788

R205097-03 Method Blank

METHOD BLANK

SDG	7284	Client/Case no	Hanford SDG_H1788
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205097-03	Client sample id	Method Blank
Dept sample id	7278-003	Material/Matrix	SOLID
		SAF No	B02-050

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.024	0.12	0.21	400	U	H
Carbon 14	14762-75-5	1.31	2.8	4.7	50	U	C
Nickel 63	13981-37-8	0.059	1.1	1.8	30	U	NI_L
Total Strontium	SR-RAD	-0.086	0.13	0.29	1.0	U	SR
Technetium 99	14133-76-7	0.225	0.28	0.55	15	U	TC
Thorium 228	14274-82-9	0	0.10	0.24		U	TH
Thorium 230	14269-63-7	0.125	0.15	0.19	1.0	U	TH
Thorium 232	TH-232	0	0.050	0.19	1.0	U	TH
Uranium 233/234	U-233/234	0	0.045	0.17	1.0	U	U
Uranium 235	15117-96-1	0	0.055	0.21	1.0	U	U
Uranium 238	U-238	0	0.045	0.17	1.0	U	U
Neptunium 237	13994-20-2	0	0.009	0.033	1.0	U	NP
Plutonium 238	13981-16-3	0	0.096	0.37	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.096	0.37	1.0	U	PU
Curium 243/244	CM-243/244	0.053	0.11	0.20	1.0	U	TP
Americium 241	14596-10-2	0.027	0.11	0.20	1.0	U	TP
Potassium 40	13966-00-2	U		0.37		U	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Niobium 94	14681-63-1	U		0.016		U	GAM
Cesium 134	13967-70-9	U		0.018		U	GAM
Cesium 137	10045-97-3	U		0.018	0.10	U	GAM
Radium 226	13982-63-3	U		0.034	0.10	U	GAM
Radium 228	15262-20-1	U		0.090	0.20	U	GAM
Europium 152	14683-23-9	U		0.051	0.10	U	GAM
Europium 154	15585-10-1	U		0.059	0.10	U	GAM
Europium 155	14391-16-3	U		0.044	0.10	U	GAM
Thorium 228	14274-82-9	U		0.026		U	GAM
Thorium 232	TH-232	U		0.090		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

216-Z-11 Ditch Borehole Samples

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/10/02

R205097-03 Method Blank

BLANK, cont.

SDG	7284	Client/Case no	Hanford SDG H1788
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R205097-03	Client sample id	Method Blank
Dept sample id	7278-003	Material/Matrix	SOLID
		SAF No	B02-050

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 238	U-238	U		2.3		U	GAM
Americium 241	14596-10-2	U		0.068		U	GAM

216-Z-11 Ditch Borehole Samples

QC-BLANK 42154

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

R205097-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7284 Client/Case no Hanford SDG H1788

Contact Melissa C. Mannion Case no No. 630

Lab sample id R205097-02 Client sample id Lab Control Sample

Dept sample id 7278-002 Material/Matrix SOLID

SAF No B02-050

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	10.9	0.55	0.49	400	J	H	11.8	0.47	92	83-117	80-120
Carbon 14	10700	210	30	50		C	11300	450	95	84-116	80-120
Nickel 63	263	4.7	1.8	30		NI_L	276	11	95	84-116	80-120
Total Strontium	22.3	0.82	0.24	1.0		SR	22.6	0.90	99	83-117	80-120
Technetium 99	120	3.2	0.54	15		TC	120	4.8	100	83-117	80-120
Thorium 230	46.3	3.8	0.24	1.0		TH	44.8	1.8	103	84-116	80-120
Uranium 233/234	19.7	1.8	0.82	1.0		U	19.3	0.77	102	83-117	80-120
Uranium 235	14.7	1.5	0.19	1.0		U	15.7	0.63	94	83-117	80-120
Uranium 238	20.3	1.8	0.79	1.0		U	21.0	0.84	97	84-116	80-120
Neptunium 237	21.0	1.1	0.14	1.0		NP	21.8	0.87	96	88-112	80-120
Plutonium 238	24.1	3.0	0.33	1.0		PU	27.0	1.1	89	81-119	80-120
Plutonium 239/240	28.9	3.5	0.33	1.0		PU	29.0	1.2	100	79-121	80-120
Curium 243/244	20.7	1.9	0.17	1.0		TP	21.2	0.85	98	84-116	80-120
Americium 241	18.6	1.7	0.17	1.0		TP	21.0	0.84	89	85-115	80-120
Cobalt 60	0.963	0.067	0.038	0.050		GAM	1.00	0.040	96	75-125	80-120
Cesium 137	1.28	0.058	0.040	0.10		GAM	1.25	0.050	102	75-125	80-120

216-Z-11 Ditch Borehole Samples

QC-LCS 42153
Note: LSC sample was spiked with Cm-244 only.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

R205121-02 B14KC7

DUPLICATE

SDG 7284 Client/Case no Hanford SDG H1788

Contact Melissa C. Mannion Case no No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R205121-02	Lab sample id	R205121-01	Client sample id	B14KC7
Dept sample id	7284-002	Dept sample id	7284-001	Location/Matrix	200 W SOLID
		Received	05/22/02	Collected/Weight	05/17/02 11:05 1745 g
% solids	92.0	% solids	92.0	Custody/SAF No	B02-050-27 B02-050

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	0.159	0.11	0.18	400	U	H	0.129	0.10	0.17	U	-	
Carbon 14	-2.31	2.4	4.2	50	U	C	-0.536	2.2	3.7	U	-	
Nickel 63	0.193	1.2	2.0	30	U	NI_L	-0.214	1.2	2.0	U	-	
Total Strontium	-0.004	0.11	0.19	1.0	U	SR	-0.132	0.10	0.19	U	-	
Technetium 99	0.082	0.28	0.59	15	U	TC	0.170	0.30	0.57	U	-	
Thorium 228	0.373	0.27	0.26			TH	0.776	0.32	0.32		70	110
Thorium 230	0.373	0.27	0.26	1.0	J	TH	0.491	0.26	0.20	J	27	131
Thorium 232	0.576	0.27	0.26	1.0	J	TH	0.698	0.26	0.20	J	19	89
Uranium 233/234	0.336	0.18	0.17	1.0	J	U	0.300	0.17	0.16	J	11	117
Uranium 235	0.027	0.054	0.21	1.0	U	U	0	0.052	0.20	U	-	
Uranium 238	0.269	0.14	0.17	1.0	J	U	0.258	0.13	0.16	J	4	109
Neptunium 237	0	0.018	0.049	1.0	U	NP	0.004	0.017	0.032	U	-	
Plutonium 238	0	0.062	0.24	1.0	U	PU	0	0.075	0.29	U	-	
Plutonium 239/240	0	0.062	0.24	1.0	U	PU	0	0.075	0.29	U	-	
Curium 243/244	0	0.086	0.21	1.0	U	TP	-0.047	0.047	0.18	U	-	
Americium 241	-0.021	0.086	0.16	1.0	U	TP	0.212	0.19	0.18	J	200	269
Potassium 40	11.0	0.95	0.46			GAM	10.2	3.1	0.40		8	56
Cobalt 60	U		0.039	0.050	U	GAM	U		0.039	U	-	
Niobium 94	U		0.033		U	GAM	U		0.032	U	-	
Cesium 134	U		0.047		U	GAM	U		0.044	U	-	
Cesium 137	U		0.041	0.10	U	GAM	U		0.036	U	-	
Radium 226	0.262	0.079	0.087	0.10		GAM	0.236	0.11	0.064		10	88
Radium 228	0.525	0.15	0.16	0.20		GAM	0.582	0.19	0.15		10	73
Europium 152	U		0.10	0.10	U	GAM	U		0.081	U	-	
Europium 154	U		0.13	0.10	U	GAM	U		0.11	U	-	
Europium 155	U		0.099	0.10	U	GAM	U		0.065	U	-	
Thorium 228	0.602	0.075	0.077			GAM	0.631	0.095	0.064		5	43
Thorium 232	0.525	0.15	0.16			GAM	0.582	0.19	0.15		10	73

216-Z-11 Ditch Borehole Samples

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/10/02

DUPLICATE, cont.

SDG	7284			Client/Case no	Hanford SDG H1788
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R205121-02	Lab sample id	R205121-01	Client sample id	B14KC7
Dept sample id	7284-002	Dept sample id	7284-001	Location/Matrix	200 W SOLID
		Received	05/22/02	Collected/Weight	05/17/02 11:05 1745 g
% solids	92.0	% solids	92.0	Custody/SAF No	B02-050-27 B02-050

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 235	U		0.25		U	GAM	U		0.11	U	-	
Uranium 238	U		4.8		U	GAM	U		3.9	U	-	
Americium 241	U		0.16		U	GAM	U		0.033	U	-	

216-Z-11 Ditch Borehole Samples

QC-DUP#1 42157

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

R205121-01 B14KC7

DATA SHEET

SDG	7284	Client/Case no	Hanford		SDG_H1788
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R205121-01	Client sample id	B14KC7		
Dept sample id	7284-001	Location/Matrix	200 W		SOLID
Received	05/22/02	Collected/Weight	05/17/02 11:05	1745 g	
% solids	92.0	Custody/SAF No	B02-050-27	B02-050	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.129	0.10	0.17	400	U	H
Carbon 14	14762-75-5	-0.536	2.2	3.7	50	U	C
Nickel 63	13981-37-8	-0.214	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.132	0.10	0.19	1.0	U	SR
Technetium 99	14133-76-7	0.170	0.30	0.57	15	U	TC
Thorium 228	14274-82-9	0.776	0.32	0.32			TH
Thorium 230	14269-63-7	0.491	0.26	0.20	1.0	J	TH
Thorium 232	TH-232	0.698	0.26	0.20	1.0	J	TH
Uranium 233/234	U-233/234	0.300	0.17	0.16	1.0	J	U
Uranium 235	15117-96-1	0	0.052	0.20	1.0	U	U
Uranium 238	U-238	0.258	0.13	0.16	1.0	J	U
Neptunium 237	13994-20-2	0.004	0.017	0.032	1.0	U	NP
Plutonium 238	13981-16-3	0	0.075	0.29	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.075	0.29	1.0	U	PU
Curium 243/244	CM-243/244	-0.047	0.047	0.18	1.0	U	TP
Americium 241	14596-10-2	0.212	0.19	0.18	1.0	J	TP
Potassium 40	13966-00-2	10.2	3.1	0.40			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Niobium 94	14681-63-1	U		0.032		U	GAM
Cesium 134	13967-70-9	U		0.044		U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	0.236	0.11	0.064	0.10		GAM
Radium 228	15262-20-1	0.582	0.19	0.15	0.20		GAM
Europium 152	14683-23-9	U		0.081	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Thorium 228	14274-82-9	0.631	0.095	0.064			GAM
Thorium 232	TH-232	0.582	0.19	0.15			GAM

216-Z-11 Ditch Borehole Samples

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/10/02

D A T A S H E E T , c o n t

SDG	7284	Client/Case no	Hanford	SDG H1788	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R205121-01	Client sample id	B14KC7		
Dept sample id	7284-001	Location/Matrix	200 W		SOLID
Received	05/22/02	Collected/Weight	05/17/02 11:05	1745 g	
% solids	92.0	Custody/SAF No	B02-050-27	B02-050	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.9		U	GAM
Americium 241	14596-10-2	U		0.033		U	GAM

216-Z-11 Ditch Borehole Samples

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test NP Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7036-049						
B14KC7	R205121-01			7284-001	U	
BLK (QC ID=42154)	R205097-03			7278-003	U	
LCS (QC ID=42153)	R205097-02			7278-002	ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
216-Z-11 Ditch Borehole Samples						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049 2σ prep error 5.0 % Reference Lab Notebook 7036 pg. 049																
B14KC7	R205121-01			0.032	0.500			68		812			54	07/09/02	07/10	SS-041
BLK (QC ID=42154)	R205097-03			0.033	0.500			65		812				07/09/02	07/10	SS-039
LCS (QC ID=42153)	R205097-02			0.14	0.500			33		812				07/09/02	07/10	SS-033
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.049	0.500			69		812			54	07/09/02	07/10	SS-042
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.064 ± 0.10
YIELD 59 ± 35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test PU Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7036-049								
B14KC7	R205121-01			7284-001	U		U	
BLK (QC ID=42154)	R205097-03			7278-003	U		U	
LCS (QC ID=42153)	R205097-02			7278-002	ok		ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
216-Z-11 Ditch Borehole Samples								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 5.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			0.29	0.500			58		109			49	07/05/02	07/05	SS-048
BLK (QC ID=42154)	R205097-03			0.37	0.500			47		108				07/05/02	07/05	SS-042
LCS (QC ID=42153)	R205097-02			0.33	0.500			50		108				07/05/02	07/05	SS-041
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.24	0.500			75		109			49	07/05/02	07/05	SS-049
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.31 ± 0.11
YIELD 58 ± 25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test TH Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 230
Preparation batch 7036-049					
B14KC7	R205121-01			7284-001	0.491 J
BLK (QC ID=42154)	R205097-03			7278-003	U
LCS (QC ID=42153)	R205097-02			7278-002	ok
Duplicate (R205121-01)	R205121-02			7284-002	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0
216-Z-11 Ditch Borehole Samples					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049 2σ prep error 5.0 % Reference Lab Notebook 7036 pg. 049																
B14KC7	R205121-01			0.20	0.250			102		176			53	07/09/02	07/09	SS-041
BLK (QC ID=42154)	R205097-03			0.19	0.250			105		176				07/09/02	07/09	SS-039
LCS (QC ID=42153)	R205097-02			0.24	0.250			106		175				07/09/02	07/09	SS-033
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.26	0.250			83		176			53	07/09/02	07/09	SS-042
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-905	Thorium in Water and Dissolved Solid Sample Using TRU and AG 1x8 Resin, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.22 ± 0.066
YIELD 99 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test TP Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241/CURIUM IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Curium 243/244		Americium 241	
Preparation batch 7036-049								
B14KC7	R205121-01			7284-001	U		0.212	J
BLK (QC ID=42154)	R205097-03			7278-003	U		U	
LCS (QC ID=42153)	R205097-02			7278-002	ok		ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U	ok	U
Nominal values and limits from method 216-Z-11 Ditch Borehole Samples				RDLs (pCi/g)	1.0		1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 5.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			0.18	0.500			84		116			49	07/05/02	07/05	SS-040
BLK (QC ID=42154)	R205097-03			0.20	0.500			77		115				07/05/02	07/05	SS-033
LCS (QC ID=42153)	R205097-02			0.17	0.500			88		115				07/05/02	07/05	SS-032
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.21	0.500			94		117			49	07/05/02	07/05	SS-041
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-961	Am-Cu Purification, Large Aliquot by Oxalate Precipitation, rev 2
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.19 ± 0.037
YIELD 86 ± 14

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test U Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7036-049											
B14KC7	R205121-01			7284-001	0.300 J	U	0.258 J	116	88	0	20
BLK (QC ID=42154)	R205097-03			7278-003	U	U	U				
LCS (QC ID=42153)	R205097-02			7278-002	ok	ok	ok				
Duplicate (R205121-01)	R205121-02			7284-002	ok J	- U	ok J	125	93	10	21
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
216-Z-11 Ditch Borehole Samples							Averages	121		5	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 5.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			0.20	0.500			96		109			49	07/05/02	07/05	SS-044
BLK (QC ID=42154)	R205097-03			0.21	0.500			96		108				07/05/02	07/05	SS-033
LCS (QC ID=42153)	R205097-02			0.82	0.500			103		108				07/05/02	07/05	SS-032
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.21	0.500			97		109			49	07/05/02	07/05	SS-047
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.36 ± 0.61
YIELD 98 ± 7

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test SR Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 7036-049					
B14KC7	R205121-01			7284-001	U
BLK (QC ID=42154)	R205097-03			7278-003	U
LCS (QC ID=42153)	R205097-02			7278-002	ok
Duplicate (R205121-01)	R205121-02			7284-002	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
216-Z-11 Ditch Borehole Samples					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 10.0 %	Reference Lab Notebook 7036 pg. 049														
B14KC7	R205121-01			0.19	1.00			99		200			49	07/05/02	07/05	GRB-221
BLK (QC ID=42154)	R205097-03			0.29	1.00			95		100				07/05/02	07/05	GRB-219
LCS (QC ID=42153)	R205097-02			0.24	1.00			98		98				07/05/02	07/05	GRB-229
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.19	1.00			95		200			49	07/05/02	07/05	GRB-222
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES
REFERENCE — SRTOT_SEP_PRECIP_GPC
CP-502 — Strontium in Solids, rev 4
CP-519 — Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.23 ± 0.096
YIELD 97 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test TC Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 7036-049						
B14KC7	R205121-01			7284-001	U	
BLK (QC ID=42154)	R205097-03			7278-003	U	
LCS (QC ID=42153)	R205097-02			7278-002	ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
216-Z-11 Ditch Borehole Samples						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049 2σ prep error 10.0 % Reference Lab Notebook 7036 pg. 049																
B14KC7	R205121-01			0.57	1.02			90		50			46	06/28/02	07/02	GRB-217
BLK (QC ID=42154)	R205097-03			0.55	1.00			93		50				06/28/02	07/01	GRB-203
LCS (QC ID=42153)	R205097-02			0.54	1.00			96		50				06/28/02	07/02	GRB-230
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.59	1.02			85		50			46	06/28/02	07/02	GRB-218
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 3
	CP-021	Preparation of Tc-99m Tracer, rev 1
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.56 ± 0.044
YIELD 91 ± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test GAM Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 7036-049								
B14KC7	R205121-01			7284-001	U		U	
BLK (QC ID=42154)	R205097-03			7278-003	U		U	
LCS (QC ID=42153)	R205097-02			7278-002	ok		ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
216-Z-11 Ditch Borehole Samples								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049 2σ prep error 15.0 % Reference Lab Notebook 7036 pg. 049																
B14KC7	R205121-01			0.30	185					718			46	07/01/02	07/02	JR,07,00
BLK (QC ID=42154)	R205097-03			0.17	209					718				07/01/02	07/02	JR,05,00
LCS (QC ID=42153)	R205097-02			0.038	209					718				07/01/02	07/02	JR,03,00
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.37	185					410			47	07/01/02	07/03	JR,05,00
Nominal values and limits from method				0.050	209					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.22 ± 0.29
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/10/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test C Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 7036-049						
B14KC7	R205121-01			7284-001	U	
BLK (QC ID=42154)	R205097-03			7278-003	U	
LCS (QC ID=42153)	R205097-02			7278-002	ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	50	
216-Z-11 Ditch Borehole Samples						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 10.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			3.7	0.269			100		100			43	06/28/02	06/29	LSC-004
BLK (QC ID=42154)	R205097-03			4.7	0.200			100		100				06/28/02	06/28	LSC-004
LCS (QC ID=42153)	R205097-02			30	0.200			100		2				06/28/02	06/29	LSC-004
Duplicate (R205121-01) (QC ID=42157)	R205121-02			4.2	0.229			100		100			43	06/28/02	06/29	LSC-004
Nominal values and limits from method				50	0.200					50			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-060 Soil Preparation, rev 3
CP-251 Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 11 ± 26
YIELD 100 ± 0

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Protocol Hanford
Version Ver 1.0
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test H Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 7036-049						
B14KC7	R205121-01			7284-001	U	
BLK (QC ID=42154)	R205097-03			7278-003	U	
LCS (QC ID=42153)	R205097-02			7278-002	ok	J
Duplicate (R205121-01)	R205121-02			7284-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	400	
216-Z-11 Ditch Borehole Samples						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 10.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			0.17	21.8			47		120			46	07/01/02	07/02	LSC-004
BLK (QC ID=42154)	R205097-03			0.21	20.0			40		120				07/01/02	07/02	LSC-004
LCS (QC ID=42153)	R205097-02			0.49	20.0			17		120				07/01/02	07/01	LSC-004
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.18	20.6			46		120			46	07/01/02	07/02	LSC-004
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES

REFERENCE	906.0_H3_LSC	
CP-060	Soil Preparation, rev 3	
CP-216	Tritium in Solid Samples by Azeotropic Distillation, rev 4	

AVERAGES ± 2 SD FOR 4 SAMPLES

MDA 0.26 ± 0.31
YIELD 38 ± 28

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1788

Test NI_L Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 7036-049						
B14KC7	R205121-01			7284-001	U	
BLK (QC ID=42154)	R205097-03			7278-003	U	
LCS (QC ID=42153)	R205097-02			7278-002	ok	
Duplicate (R205121-01)	R205121-02			7284-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	30	
216-Z-11 Ditch Borehole Samples						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7036-049	2σ prep error 10.0 %			Reference Lab Notebook 7036 pg. 049												
B14KC7	R205121-01			2.0	0.500			91	100				47	07/03/02	07/03	LSC-005
BLK (QC ID=42154)	R205097-03			1.8	0.500			97	100					07/03/02	07/03	LSC-005
LCS (QC ID=42153)	R205097-02			1.8	0.500			96	100					07/03/02	07/03	LSC-005
Duplicate (R205121-01) (QC ID=42157)	R205121-02			2.0	0.500			89	100				48	07/03/02	07/04	LSC-005
Nominal values and limits from method				30	0.500			30-105	50				180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 3
	CP-431	Nickel-63 Purification, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.9 ± 0.23
YIELD 93 ± 8

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Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1788

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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REPORT GUIDE

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Case no SDG H1788

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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REPORT GUIDE

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

SDG 7284
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1788

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/10/02

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-050-27	Page 1 of 1

Collector FAHLBERG	Company Contact D JACQUES	Telephone No. 372-9651	Project Coordinator TRENT, SJ	Price Code 8N / Data Turnaround 45 Days
Project Designation 216-Z-11 Ditch Borehole Samples	Sampling Location 200 W H1788 (7284)		SAF No. B02-050	Air Quality ☐
Ice Chest No. SEE OSPC	Field Logbook No. EL 1517-3	COA B20CW5674C	Method of Shipment Fed EX	
Shipped To (TMA)RECRA	Offsite Property No. A020152		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B14LK4

Special Handling and/or Storage

NONE

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	(1)	(1)	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to

RT 5.21.02 (line-out)

Sample No.	Matrix *	Sample Date	Sample Time										
B14KC7	SOIL	5.17.02	1105								X	X	B14LK4

Personnel not available to relinquish samples from the 3728 Ref # ZA on 5/25/02 RT

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From R.Fahlberg R.Fahlberg	5.17.02 1105	Received By/Stored In Ref ZA	5-17-02 1105
Relinquished By/Removed From Ref ZA 3728	5/21/02 1000	Received By/Stored In R Thoren	5.21.02 1000
Relinquished By/Removed From RT R Thoren	5.21.02 1000	Received By/Stored In FED EX	5-21-02
Relinquished By/Removed From FED. EXPRESS	5-22-02 10:20	Received By/Stored In 8CA-2 E. Mestas E. MESTAS	5-22-02 10:20
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

See SAF

~~(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)~~

~~(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3, NO2/NO3 - 353.1; Sulfides - 9030~~

~~(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}~~

~~(4) Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}~~

RT 5.21.02

(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Tritium - H3; Isotopic Uranium

(6) Isotopic Plutonium; Americium-241/Curium-244 {Americium-241}; Americium-241/Curium-244 (Add-on) {Curium-243}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

EBERLINE SERVICES — **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

R205121 - 7284

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 5-22-02 10:30

CoC No. B02-050-27

Container I.D. No. ERC-00-006 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 2			
7.	Number of containers per sample: _____ (Or see CoC 2)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [✓] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	Describe any anomalies: _____			
13.	Was P.M. notified of any anomalies? Yes [✓] No [ ] Date 5-22-02			
14.	Received by _____ Date: 5-22-02 Time: 1013			

Customer Sample No.	cpm	mr/hr	wipe	Customer Sample No.	cpm	mr/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha meter Ser. No. _____ Calibration date _____

Survey Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

1 July 2002

Joan Kessner
Bechtel-Hanford, Inc.
3190 Washington Way
MSIN H9-03
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0205L734
SDG #	H1788
SAF #	B02-050
Date Received	5-22-02
# Samples	1
Matrix	Soil
Volatiles	X
Semivolatiles	X
Pest/PCB	X
DRO	X
GRO	
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7	001	S	02LVG145	05/17/02	N/A	05/29/02
B14KC7	001 MS	S	02LVG145	05/17/02	N/A	05/29/02
B14KC7	001 MSD	S	02LVG145	05/17/02	N/A	05/29/02
LAB QC:						
VBLKYX	MB1	S	02LVG145	N/A	N/A	05/29/02
VBLKYX	MB1 BS	S	02LVG145	N/A	N/A	05/29/02

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-050
LVL #: 0205L734
SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-2002

GC/MS VOLATILE

One (1) soil sample was collected on 05-17-2002.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for client specified volatile target compounds on 05-29-2002.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. The required analysis holding time was met.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminant Acetone at a level less than the CRQL.

8. Internal standard area and retention time criteria were met.

9. A spectral search was performed for the compounds Tetrahydrofuran; however, this compound was not detected in the sample.

10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

for St O well

J. Michael Taylor
President
Lionville Laboratory Incorporated

06-18-02
Date

som\group\data\voa\tnu-hanford\0205-734.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 0 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

VLI
LIONVILLE LABORATORY INC.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

VLI
VONVILLE LABORATORY INC.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Volatiles by GC/MS, Appendix IX List — Report Date: 06/14/02 11:08

RFW Batch Number: **0205L734** — Client: **TNUHANFORD B02-050 H1788** Work Order: 11343606001 Page: 1a

	Cust ID:	B14KC7	B14KC7	B14KC7	VBLKYX	VBLKYX BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LVG145-MB1	02LVG145-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.04	0.943	0.962	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	103 %	98 %	98 %	90 %	104 %
	Bromofluorobenzene	100 %	93 %	92 %	84 %	104 %
	1,2-Dichloroethane-d4	93 %	90 %	92 %	86 %	102 %
Chloromethane		12 U	10 U	11 U	10 U	10 U
Bromomethane		12 U	10 U	11 U	10 U	10 U
Vinyl Chloride		6 U	5 U	6 U	5 U	5 U
Chloroethane		12 U	10 U	11 U	10 U	10 U
Methylene Chloride		11	7	9	5 U	4 J
Acetone		31 B	29 B	29 B	3 J	22 B
Carbon Disulfide		6 U	5 U	6 U	5 U	5 U
1,1-Dichloroethene		6 U	79 %	79 %	5 U	83 %
1,1-Dichloroethane		6 U	5 U	6 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	5 U	6 U	5 U	5 U
Chloroform		6 U	5 U	6 U	5 U	5 U
1,2-Dichloroethane		6 U	5 U	6 U	5 U	5 U
2-Butanone		12 U	10 U	11 U	10 U	10 U
1,1,1-Trichloroethane		6 U	5 U	6 U	5 U	5 U
Carbon Tetrachloride		4 U	3 U	3 U	3 U	3 U
Bromodichloromethane		6 U	5 U	6 U	5 U	5 U
1,2-Dichloropropane		6 U	5 U	6 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	5 U	6 U	5 U	5 U
Trichloroethene		6 U	89 %	90 %	5 U	96 %
Dibromochloromethane		6 U	5 U	6 U	5 U	5 U
1,1,2-Trichloroethane		6 U	5 U	6 U	5 U	5 U
Benzene		6 U	90 %	93 %	5 U	99 %
Trans-1,3-Dichloropropene		6 U	5 U	6 U	5 U	5 U
Bromoform		6 U	5 U	6 U	5 U	5 U
4-Methyl-2-pentanone		12 U	10 U	11 U	10 U	10 U
2-Hexanone		12 U	10 U	11 U	10 U	10 U
Tetrachloroethene		6 U	5 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	5 U	6 U	5 U	5 U
Toluene		6 U	108 %	107 %	5 U	113 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0205L734** Client: **TNUHANFORD B02-050 H1788** Work Order: 11343606001 Page: 1b

Cust ID:	B14KC7	B14KC7	B14KC7	VBLKYX	VBLKYX BS
RFW#:	001	001 MS	001 MSD	02LVG145-MB1	02LVG145-MB1
Chlorobenzene	6 U	99 %	100 %	5 U	105 %
Ethylbenzene	6 U	5 U	6 U	5 U	5 U
Styrene	6 U	5 U	6 U	5 U	5 U
Xylene (total)	6 U	5 U	6 U	5 U	5 U
Trichlorofluoromethane	6 U	5 U	6 U	5 U	5 U
Cyclohexanone	60 U	50 U	55 U	50 U	50 U
1,2,4-Trimethylbenzene	6 U	5 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0205L734

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client HANFORD SAF# B02-050

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 5-22-02 Date Due 6-21-02

	A	B	C			D	E		F	G			
Refrigerator #	1	6	6			6	6		6	6			
#/Type Container – Liquid													
#/Type Container – Solid	1AG	1AG	1AG			1PL	1AG		1AG	1AG	→	→	→
Volume – Liquid													
Volume – Solid	250	250	250			L	250		120	120	→	→	→
Preservatives	–	–	–			–	–		–	→	→	→	→
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb		IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Range	WTPH-D TPH Gasoline Range	WTPH G	
Lionville Laboratory Use Only	0624VN	0625X	OPCB			INORG ①	MET ①		ICR6	ODRO	OGRO		

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb		IC Anion	Metal	CN	Hex Chrom	TPH Diesel	WTPH-D	WTPH G	
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1			1	1		1	1	/	/	/

Special Instructions: SAF # B02-050

DATE/REVISIONS:
MET ① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni,
2. V, Zn.
INORG ① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790529371090

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-050-27	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
FAHLBERG	D JACQUES 372-9651	TRENT, SJ	8N / 45 Days
Project Designation	**Sampling Location**	**SAF No.**	**Air Quality** ☐
216-Z-11 Ditch Borehole Samples	200 W	B02-050	
Ice Chest No. SEE OSPC	**Field Logbook No.** EL 1517 - 3	**COA** B20CW5674C	**Method of Shipment** Fed EX
Shipped To TMA/RECRA	**Offsite Property No.** A0 20139		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS RT 5.21.02
Tie to B14LK4

Special Handling and/or Storage
None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to

Sample No.	Matrix *	Sample Date	Sample Time										
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

RT
Personnel not available to relinquish samples from the 3728
Ref # 2A on 5/21/02

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg / R. Fahlberg	1105 5.17.02	Ref 2A	1105 5.17.02
R. Ref 2A 3728	5.21.02 0000	R Thorek	5.21.02 0000
R Thorek	5.21.02 ERC 0000	FEDEX	
FedEx	5-22-02 1000	Hernandez	5-22-02 1000

SPECIAL INSTRUCTIONS
See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030
(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}
(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}
~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium - H3; Isotopic Uranium~~
~~(6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~
RT 5.21.02

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22-02

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: 0205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Keith Kennedy

Laboratory Project Manager:

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

RFW LOT # :0205L734

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B14KC7	001	S	02LE0581	05/17/02	05/22/02	05/24/02	05/31/02
B14KC7	001 MS	S	02LE0581	05/17/02	05/22/02	05/24/02	05/31/02
B14KC7	001 MSD	S	02LE0581	05/17/02	05/22/02	05/24/02	05/31/02
LAB QC:							
SBLKVM	MB1	S	02LE0581	N/A	N/A	05/24/02	06/03/02
SBLKVM	MB1 BS	S	02LE0581	N/A	N/A	05/24/02	06/03/02

01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-050
LVL #: 0205L734
SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-2002

SEMIVOLATILE

One (1) soil sample was collected on 05-17-2002.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 05-24-2002 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-31-2002 and 06-03-2002.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. The sample was extracted and analyzed within required holding time.

3. Non-target compounds were detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

8. Internal standard area criteria were not met for samples B14KC7 MSD, 02LE0581-MB1 and 02LE0581-MB1 BS; however, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly; all surrogate and spike recoveries were within QC limits; consequently, the sample was not reanalyzed.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

06-10-02
Date

som\gorup\data\bna\tnu-hanford-0205-734.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List — Report Date: 06/07/02 11:01

RFW Batch Number: 0205L734 — Client: TNUHANFORD B02-050 H1788 — Work Order: 11343606001 — Page: 1a

	Cust ID:	B14KC7	B14KC7	B14KC7	SBLKVM	SBLKVM BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE0581-MB1	02LE0581-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	75 %	82 %	85 %	84 %	76 %
	2-Fluorobiphenyl	77 %	88 %	85 %	86 %	79 %
	p-Terphenyl-d14	117 %	107 %	114 %	106 %	98 %
	Phenol-d5	78 %	85 %	81 %	82 %	80 %
	2-Fluorophenol	76 %	82 %	79 %	79 %	77 %
	2,4,6-Tribromophenol	94 %	91 %	90 %	81 %	82 %
Phenol		370 U	86 %	82 %	330 U	80 %
bis(2-Chloroethyl)ether		370 U	370 U	370 U	330 U	330 U
2-Chlorophenol		370 U	87 %	86 %	330 U	82 %
1,3-Dichlorobenzene		370 U	370 U	370 U	330 U	330 U
1,4-Dichlorobenzene		370 U	66 %	67 %	330 U	68 %
1,2-Dichlorobenzene		370 U	370 U	370 U	330 U	330 U
2-Methylphenol		370 U	370 U	370 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		370 U	370 U	370 U	330 U	330 U
3- and/or 4-Methylphenol		370 U	370 U	370 U	330 U	330 U
N-Nitroso-Di-n-propylamine		370 U	79 %	75 %	330 U	84 %
Hexachloroethane		370 U	370 U	370 U	330 U	330 U
Nitrobenzene		370 U	370 U	370 U	330 U	330 U
Isophorone		370 U	370 U	370 U	330 U	330 U
2-Nitrophenol		370 U	370 U	370 U	330 U	330 U
2,4-Dimethylphenol		370 U	370 U	370 U	330 U	330 U
bis(2-Chloroethoxy)methane		370 U	370 U	370 U	330 U	330 U
2,4-Dichlorophenol		370 U	370 U	370 U	330 U	330 U
1,2,4-Trichlorobenzene		370 U	75 %	73 %	330 U	71 %
Naphthalene		370 U	370 U	370 U	330 U	330 U
4-Chloroaniline		370 U	370 U	370 U	330 U	330 U
Hexachlorobutadiene		370 U	370 U	370 U	330 U	330 U
4-Chloro-3-methylphenol		370 U	87 %	89 %	330 U	82 %
2-Methylnaphthalene		370 U	370 U	370 U	330 U	330 U
Hexachlorocyclopentadiene		370 U	370 U	370 U	330 U	330 U
2,4,6-Trichlorophenol		370 U	370 U	370 U	330 U	330 U
2,4,5-Trichlorophenol		920 U	920 U	920 U	830 U	830 U

*= Outside of EPA CLP QC limits.

Cust ID:	B14KC7		B14KC7		B14KC7		SBLKVM		SBLKVM BS	
RFW#:	001		001 MS		001 MSD		02LE0581-MB1		02LE0581-MB1	
2-Chloronaphthalene	370	U	370	U	370	U	330	U	330	U
2-Nitroaniline	920	U	920	U	920	U	830	U	830	U
Dimethylphthalate	370	U	370	U	370	U	330	U	330	U
Acenaphthylene	370	U	370	U	370	U	330	U	330	U
2,6-Dinitrotoluene	370	U	370	U	370	U	330	U	330	U
3-Nitroaniline	920	U	920	U	920	U	830	U	830	U
Acenaphthene	370	U	79	%	79	%	330	U	76	%
2,4-Dinitrophenol	920	U	920	U	920	U	830	U	830	U
4-Nitrophenol	920	U	72	%	45	%	830	U	79	%
Dibenzofuran	370	U	370	U	370	U	330	U	330	U
2,4-Dinitrotoluene	370	U	80	%	75	%	330	U	76	%
Diethylphthalate	370	U	370	U	370	U	330	U	330	U
4-Chlorophenyl-phenylether	370	U	370	U	370	U	330	U	330	U
Fluorene	370	U	370	U	370	U	330	U	330	U
4-Nitroaniline	920	U	920	U	920	U	830	U	830	U
4,6-Dinitro-2-methylphenol	920	U	920	U	920	U	830	U	830	U
N-Nitrosodiphenylamine (1)	370	U	370	U	370	U	330	U	330	U
4-Bromophenyl-phenylether	370	U	370	U	370	U	330	U	330	U
Hexachlorobenzene	370	U	370	U	370	U	330	U	330	U
Pentachlorophenol	920	U	95	%	89	%	830	U	87	%
Phenanthrene	370	U	370	U	370	U	330	U	330	U
Anthracene	370	U	370	U	370	U	330	U	330	U
Carbazole	370	U	370	U	370	U	330	U	330	U
Di-n-Butylphthalate	370	U	370	U	370	U	330	U	330	U
Fluoranthene	370	U	370	U	370	U	330	U	330	U
Pyrene	370	U	108	%	112	%	330	U	96	%
Butylbenzylphthalate	370	U	370	U	370	U	330	U	330	U
3,3'-Dichlorobenzidine	370	U	370	U	370	U	330	U	330	U
Benzo(a)anthracene	370	U	370	U	370	U	330	U	330	U
Chrysene	370	U	370	U	370	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	59	JB	51	JB	52	JB	36	J	41	JB
Di-n-Octyl phthalate	370	U	370	U	370	U	330	U	330	U
Benzo(b)fluoranthene	370	U	370	U	370	U	330	U	330	U
Benzo(k)fluoranthene	370	U	370	U	370	U	330	U	330	U
Benzo(a)pyrene	370	U	370	U	370	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	370	U	370	U	370	U	330	U	330	U
Dibenzo(a,h)anthracene	370	U	370	U	370	U	330	U	330	U
Benzo(g,h,i)perylene	370	U	370	U	370	U	330	U	330	U
Tributylphosphate	370	U	370	U	370	U	330	U	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B14KC7

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1788

Matrix: (soil/water) SOIL

Lab Sample ID: 0205L734-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A053107

Level: (low/med) LOW

Date Received: 05/22/02

% Moisture: 10 decanted: (Y/N)__

Date Extracted: 05/24/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/31/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	7.607	200	JAB
2.		ALDOL CONDENSATE	8.321	2000	JAB
3.		ALDOL CONDENSATE	9.641	200	JAB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKVM

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1788

Matrix: (soil/water) SOIL

Lab Sample ID: 02LE0581-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A060308

Level: (low/med) LOW

Date Received: 05/24/02

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 05/24/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 06/03/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	7.478	100	JA
2.		ALDOL CONDENSATE	8.194	1000	JA
3.		ALDOL CONDENSATE	9.525	100	JA

nville Laboratory Use Only
0205L734

Custody Transfer Record/Lab Work Request

LvLI LIONVILLE LABORATORY INC.

010

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: HANFORD SAF# B02-050
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: SPEC Del: STD TAT: 30 days
Date Rec'd: 5-22-02 Date Due: 6-21-02

	A	B	C				D	E		F	G				
Refrigerator #	1	6	6				6	6		6	6				
#/Type Container – Liquid															
#/Type Container – Solid	1AG	1AG	1AG				1PL	1AG		1AG	1AG				
Volume – Liquid															
Volume – Solid	250	250	250				L	250		120	120				
Preservatives	—	—	—				—	—		—	—				
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb			IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Range	WTPH-D TPH Gasoline Range	WTPH G		
Lionville Laboratory Use Only	0624N	0625X	0PCB				INORG①	MET①		ICR6	ODRO	OGRO			

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb			IC Anion	Metal	CN	Hex Chrom	TPH Diesel	TPH Gasoline	WTPH G
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1				1	1		1	1	/	/

Special Instructions: SAF # B02-050

DATE/REVISIONS:
MET① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni,
2. V, Zn.
INORG① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 790529371090

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-050-27 | Page 1 of 1

Bechtel Hanford Inc.

Collector FAHLBERG	**Company Contact** D JACQUES	**Telephone No.** 372-9651	**Project Coordinator** TRENT, SJ
Project Designation 216-Z-11 Ditch Borehole Samples	**Sampling Location** 200 W		**SAF No.** B02-050
Ice Chest No. SEE OSPC	**Field Logbook No.** EL 1517 - 3	**COA** B20CW5674C	**Method of Shipment** Fed EX
Shipped To TMA/RECRA	**Offsite Property No.** HØ 20139		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 8N | **Data Turnaround** 45 Days | **Air Quality** ☐

POSSIBLE SAMPLE HAZARDS/REMARKS RS 5.21.02

Tie to B14LK4

Special Handling and/or Storage

None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to
Sample No.	Matrix *	Sample Date	Sample Time							
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

Personnel not available to relinquish samples from the 3728 Ref # 2A on 5/21/02 RT

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg R. Fahlberg	1105 5.17.02	Ref 2-A	1105 5-17-02
R. of 2A 3728	5.21.02 1000	R. Thoren	5.21.02 1000
R. Thoren	5.21.02 1000	FEDEX	
FedEx	5-22-02 1000	J. Hernandez	5-22-02 1000

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)

(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030

(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}

(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}

~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium -- H3; Isotopic Uranium~~

~~(6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED

SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

DATE: 5-22-02

Purchase Order/Project:

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Keith Kennedy

Laboratory Project Manager:

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7	001	S	02LE0580	05/17/02	05/23/02	06/01/02
B14KC7	001 MS	S	02LE0580	05/17/02	05/23/02	06/01/02
B14KC7	001 MSD	S	02LE0580	05/17/02	05/23/02	06/01/02
LAB QC:						
PBLKQE	MB1	S	02LE0580	N/A	05/23/02	06/01/02
PBLKQE	MB1 BS	S	02LE0580	N/A	05/23/02	06/01/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-050
LVL #: 0205L734
SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-02

PCB

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were extracted on 05-23-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 06-01-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The sample and its associated QC samples received a sulfuric acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/18/02
Date

pef\r:\group\data\pest\tnu hanford\05L-734.pcb

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 06/11/02 14:44

RFW Batch Number: **0205L734** Client: **TNUHANFORD B02-050 H1788** Work Order: 11343606001 Page: 1

	Cust ID:	B14KC7	B14KC7	B14KC7	PBLKQE	PBLKQE BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE0580-MB1	02LE0580-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		80 %	80 %	100 %	90 %	110 %
Decachlorobiphenyl		105 %	100 %	115 %	105 %	120 %
Aroclor-1016		37 U	74 %	86 %	33 U	90 %
Aroclor-1221		74 U	74 U	74 U	67 U	67 U
Aroclor-1232		37 U	37 U	37 U	33 U	33 U
Aroclor-1242		37 U	37 U	37 U	33 U	33 U
Aroclor-1248		37 U	37 U	37 U	33 U	33 U
Aroclor-1254		37 U	37 U	37 U	33 U	33 U
Aroclor-1260		37 U	82 %	93 %	33 U	96 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only
0205L734

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI — LIONVILLE LABORATORY INC. 9

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: HANFORD SAF# B02-050

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 5-22-02 Date Due: 6-21-02

	A	B	C			D	E		F	G			
Refrigerator #	1	6	6			6	6		6	6			
#/Type Container – Liquid													
#/Type Container – Solid	1AG	1AG	1AG			1PL	1AG		1AG	1AG	→		
Volume – Liquid													
Volume – Solid	250	250	250			L	250		120	120	→		
Preservatives	–	–	–			–	–		–	–	–		
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest/PCB	Herb		IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Range	WTPH-D TPH Gasoline Range	WTPH-G	
Lionville Laboratory Use Only	0624N	0625X	0PCB			INORG①	MET①		ICR6	ODRO	OGRO		

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb		IC Anion	Metal	CN	Hex Chrom	TPH Diesel	TPH Gasoline	WTPH-G	
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1			1	1		1	✓	/	/	/

Special Instructions: SAF # B02-050

DATE/REVISIONS:
1. MET① RCRA + Be, B, Cu, Mg, Mn, Mo, Ni
2. V, Zn.
3. INORG① ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 790529371090

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B02-050-27	Page 1 of 1
Collector FAHLBERG	Company Contact D JACQUES	Telephone No. 372-9651	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐	Data Turnaround 45 Days
Project Designation 216-Z-11 Ditch Borehole Samples	Sampling Location 200 W		SAF No. B02-050		
Ice Chest No. SEE OSPC	Field Logbook No. EL 1517 • 3	COA B20CW5674C	Method of Shipment Fed EX		
Shipped To TMA/RECRA	Offsite Property No. AO 20139		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B14LK4 RT 5.21.02

Special Handling and/or Storage

None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to

RT 5.21.02

Sample No.	Matrix *	Sample Date	Sample Time										
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

Personnel not available to relinquish samples from the 3728
Ref # 2A on 5/21/02 RT

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1105	Received By/Stored In	Date/Time 1105
R. Fahlberg	5-17-02	Ref 2-A	5-17-02
Relinquished By/Removed From	Date/Time 1000	Received By/Stored In	Date/Time 1000
Ref 2A 3728	5.21.02	RT R Thoren	5.21.02
Relinquished By/Removed From	Date/Time 1000	Received By/Stored In	Date/Time
R T R Thoren	5.21.02 ERC	FEDEX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FedEx	5-22-02 1000	C Hernandez	5-22-02 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030
(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}
(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}
~~(5) Gamma Spec Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium -- H3; Isotopic Uranium~~
~~(6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}; Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22-02

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Kelly Kennedy

Laboratory Project Manager:

Lionville Laboratory, Inc.
GRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7	001	S	02LVJ531	05/17/02	N/A	05/31/02
B14KC7	001 MS	S	02LVJ531	05/17/02	N/A	05/31/02
B14KC7	001 MSD	S	02LVJ531	05/17/02	N/A	05/31/02
LAB QC:						
TBLKEQ	MB1	S	02LVJ531	N/A	N/A	05/31/02
TBLKEQ	MB1 BS	S	02LVJ531	N/A	N/A	05/31/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B02-050
LVL #: 0205L734
SDG/SAF#: H01788/B02-050

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-02

GRO

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 05-31-02. The analysis met the intent of method WTPH-G.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. One (1) of five (5) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. The blank spike recovery was within acceptance criteria.

6. All matrix spike recoveries were outside acceptance criteria. A copy of the SDR has been enclosed.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

6/10/02

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

Date

pef\r\group\data\gro\05-734.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: 026C262.

Initiator: John Lach. Batch: 0205L734 Parameter: OGRO
Date: 6/4/02 Samples: ms, msD Matrix: Soil
Client: TnV Method: SW846/MCAWW/CLP/ Prep Batch: 02LVS531

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Transcription Error __ Client Request __ Wrong Test Code __ Sampler Error on C-O-C __ Other ______

b. General Discrepancy
__ Missing Sample/Extract* __ Hold Time Exceeded __ Improper Bottle Type
__ Container Broken __ Insufficient Sample* __ Not Amenable to Analysis
__ Wrong Sample Pulled __ Preservation Wrong
__ Label ID's Illegible __ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

c. Problem (Include all relevant specific results; attach data if necessary)
ms, msD below acceptable limits for GRO.
msD surrogate below acceptable limits

2. Known or Probable Causes(s)
a Retention time shift from a tank change - several late eluting components of the gasoline spike ~~shifted~~ eluted later than the GRO window. Negligible impact on calculated recovery of ms/msD spikes [signature] 6/5/02

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: ______
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ______
__ Place On/Take Off Hold (circle)

Other Description: NWATT. 25%
The sample does not contain any hits at ~~X4~~ or greater of the reporting limit. The Blank Blank spike and sample are in control

[signature] 6/4/02

4. Project Manager Instructions...signature/date: ______
✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person ______
__ Add
__ Cancel

5. Final Action...signature/date: JL 6/5/02. Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: ______

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

LIONVILLE LABORATORY INC.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/GCVOLATILE/GCVOLATILEGLOS.DOC

Lionville Laboratory, Inc.

GAS RANGE ORGANICS

Report Date: 06/05/02 10:24

RFW Batch Number: **0205L734** Client: **TNUHANFORD B02-050 H1788** Work Order: 11343606001 Page: 1

	Cust ID:	B14KC7	B14KC7	B14KC7	TBLKEQ	TBLKEQ BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LVJ531-MB1	02LVJ531-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,5-Dibromotoluene		67 %	63 %	45 * %	74 %	67 %
Gasoline Range Organics (GRO)		33 U	36 * %	34 * %	30 U	55 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

0205L734

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client HANFORD SAF# B02-050

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 5-22-02 Date Due 6-21-02

	A	B	C				D	E		F	G				
Refrigerator #	1	6	6				6	6		6	6				
#/Type Container Liquid															
#/Type Container Solid	1AG	1AG	1AG				1PL	1AG		1AG	1AG	→			
Volume Liquid															
Volume Solid	250	250	250				L	250		120	120	→			
Preservatives	—	—	—				—	—		—	—	→			
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest/PCB	Herb			IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Range	WTPH-D TPH Gasoline Range	WTPH G		
Lionville Laboratory Use Only	0624N	0625X	OPCB				INORG①	MET①		ICR6	ODRO	OGRO			

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb			IC Anion	Metal	CN	Hex Chrom	TPH Diesel	TPH Gasoline			
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1				1	1		1	1	/	/	/	/

Special Instructions: SAF # B02-050

DATE/REVISIONS:
MET① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni,
2. V, Zn.
INORG① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790529371090

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-050-27 | Page 1 of 1

Collector: FAHLBERG	Company Contact: D JACQUES	Telephone No.: 372-9651	Project Coordinator: TRENT, SJ
Project Designation: 216-Z-11 Ditch Borehole Samples	Sampling Location: 200 W		SAF No.: B02-050
Ice Chest No.: SEE OSPC	Field Logbook No.: EL 1517 - 3	COA: B20CW5674C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: H Ø 20139		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS: RTS.2102

Tie to B14LK4

Special Handling and/or Storage: None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	

Sample No.	Matrix *	Sample Date	Sample Time									
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X		B14LK4

Personnel not available to relinquish samples from the 3728 Ref # 2A on 5/21/02 RT

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg / R. Fahlberg 5.17.02	1105	Ref 2A 5-17-02	1105
Ref 2A 3728 5.21.02	0000	RT Thoren 5.21.02	0000
RT Thoren 5.21.02 ERC	0000	FedEx	
FedEx	5-22-02 1000	[illegible]	5-22-02 1200

Sign/Print Names

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)

(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030

(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}

(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}

~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium -- H3; Isotopic Uranium (6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

DATE: 5-22-02

Purchase Order/Project:

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Keith Kennedy

Laboratory Project Manager:

Lionville Laboratory, Inc.

DRO ANALYTICAL DATA PACKAGE FOR

TNU-HANFORD B02-050 H 1789

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7	001	S	02LE0588	05/17/02	05/24/02	06/03/02
B14KC7	001 MS	S	02LE0588	05/17/02	05/24/02	06/03/02
B14KC7	001 MSD	S	02LE0588	05/17/02	05/24/02	06/03/02
LAB QC:						
BLK	MB1	S	02LE0588	N/A	05/24/02	06/03/02
BLK	MB1 BS	S	02LE0588	N/A	05/24/02	06/03/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-050
LVL #: 0205L734
SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-02

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were prepared on 05-24-02 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 06-03-02. The analysis met the intent of method WTPH-D.

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recovery was within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/10/02
Date

pef\r:\troup\data\dro\05L-710.doc

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

LIONVILLE LABORATORY INC.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 06/04/02 08:49

RFW Batch Number: **0205L734** Client: **TNU-HANFORD B02-050** Work Order: 11343606001 Page: 1

	Cust ID:	B14KC7	B14KC7	B14KC7	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE0588-MB1	02LE0588-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
p-Terphenyl		44 %	45 %	49 %	40 %	48 %
Diesel Range Organics		12.0 U	58 %	62 %	12.0 U	71 %
Motor Oil		12.0 U	12.0 U	12.0 U	12.0 U	12.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

0205L734

Custody Transfer Record/Lab Work Request

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: HANFORD SAF# B02-050

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 5-22-02 Date Due: 6-21-02

	A	B	C			D	E		F	G			
Refrigerator #	1	6	6			6	6		6	6			
#/Type Container Liquid													
#/Type Container Solid	1AG	1AG	1AG			1PL	1AG		1AG	1AG	→		
Volume Liquid													
Volume Solid	250	250	250			L	250		120	120	→		
Preservatives	—	—	—			—	—		—	—	—	—	
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest/PCB	Herb		IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Range	WTPH-D TPH Gasoline Range	WTPH G	
Lionville Laboratory Use Only	0624N	0625X	0PCB			INORG①	MET①		ICR6	ODRO	OGRO		

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb		IC Anion	Metal	CN	Hex Chrom	TPH Diesel	TPH Gasoline	WTPH G	
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1			1	1		1	1	✓	✓	✓

Special Instructions: SAF # B02-050

DATE/REVISIONS:
MET① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni,
2. V, Zn.
INORG① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ____
Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 790529371090

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-050-27

Collector: FAHLBERG
Company Contact: D JACQUES
Telephone No.: 372-9651
Project Coordinator: TRENT, SJ
Price Code: 8N
Data Turnaround: 45 Days
Air Quality ☐

Project Designation: 216-Z-11 Ditch Borehole Samples
Sampling Location: 200 W
SAF No.: B02-050

Ice Chest No.: SEE OSPC
Field Logbook No.: EL 1517 . 3
COA: B20CW5674C
Method of Shipment: Fed EX

Shipped To: TMA(RECRA)
Offsite Property No.: A Ø 20139
Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS: RTS.21.02 Tie to B14LK4

Special Handling and/or Storage: None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to

RT 5.21.02

Sample No.	Matrix *	Sample Date	Sample Time										
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

Personnel not available to relinquish samples from the 3728 Ref # 2A on 5/21/02 RT

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg R.Fahlberg	5.17.02 1105	Ref 2A	5.17.02 1105
Ref 2A 3728	5.21.02 0800	RT R Thoren	5.21.02 0800
RT R Thoren	5.21.02 0800 ERC	FedEx	
FedEx	5-22-02 1000	[illegible]	5-22-02 1000

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030
(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}
(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}
~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium - H3; Isotopic Uranium~~
~~(6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

DATE: 5-22-02

Purchase Order/Project:

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Kelli Kennedy

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7						
SILVER, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
SILVER, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
SILVER, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MERCURY, TOTAL	001	S	02C0159	05/17/02	06/06/02	06/07/02
MERCURY, TOTAL	001 REP	S	02C0159	05/17/02	06/06/02	06/07/02
MERCURY, TOTAL	001 MS	S	02C0159	05/17/02	06/06/02	06/07/02
MAGNESIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MAGNESIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
MAGNESIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MOLYBDENUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MOLYBDENUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MOLYBDENUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02

LAB QC:

SILVER LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
SILVER, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
ARSENIC LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
ARSENIC, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BORON LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
BORON, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BARIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
BARIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BERYLLIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
BERYLLIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
CADMIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
CADMIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
CHROMIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
CHROMIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
COPPER LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
COPPER, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MERCURY LABORATORY	LC1 BS	S	02C0159	N/A	06/06/02	06/07/02
MERCURY, TOTAL	MB1	S	02C0159	N/A	06/06/02	06/07/02
MAGNESIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MANGANESE LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
MANGANESE, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MOLYBDENUM LABORATOR	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
MOLYBDENUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
NICKEL LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
NICKEL, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
LEAD LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
LEAD, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
SELENIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
SELENIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
VANADIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
VANADIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
ZINC LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
ZINC, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-050
LVL#: 0205L734
SDG/SAF#: H1788/B02-050

W.O.#: 11343-606-001-9999-00
Date Received: 05-22-02

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 3 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B14KC7	Chromium	200	104.2
	Magnesium	200	91.2
	Manganese	2000	106.9

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/13/11
Date

gmb/m05-734

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0205L734

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	✓6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	✓6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B14KC7	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Arsenic, Total	0.57	MG/KG	0.26	1.0
		Boron, Total	0.15 u	MG/KG	0.15	1.0
		Barium, Total	53.9	MG/KG	0.01	1.0
		Beryllium, Total	0.29	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	10.2	MG/KG	0.05	1.0
		Copper, Total	8.6	MG/KG	0.03	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Magnesium, Total	2360	MG/KG	0.59	1.0
		Manganese, Total	217	MG/KG	0.01	1.0
		Molybdenum, Total	0.72	MG/KG	0.12	1.0
		Nickel, Total	10.9	MG/KG	0.1	1.0
		Lead, Total	2.0	MG/KG	0.18	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	19.6	MG/KG	0.07	1.0
		Zinc, Total	21.8	MG/KG	0.04	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	02L0299-MB1	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Arsenic, Total	0.25 u	MG/KG	0.25	1.0
		Boron, Total	0.14 u	MG/KG	0.14	1.0
		Barium, Total	0.19	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.05 u	MG/KG	0.05	1.0
		Copper, Total	0.03 u	MG/KG	0.03	1.0
		Magnesium, Total	4.8	MG/KG	0.56	1.0
		Manganese, Total	0.19	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Nickel, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.17 u	MG/KG	0.17	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Vanadium, Total	0.07 u	MG/KG	0.07	1.0
		Zinc, Total	0.04 u	MG/KG	0.04	1.0
BLANK1	02C0159-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B14KC7	Silver, Total	4.9	0.05u	5.3	92.5	1.0
		Arsenic, Total	201	0.57	211	94.8	1.0
		Boron, Total	89.7	0.15u	106	84.9	1.0
		Barium, Total	279	53.9	211	106.6	1.0
		Beryllium, Total	5.3	0.29	5.3	94.6	1.0
		Cadmium, Total	5.1	0.03u	5.3	96.2	1.0
		Chromium, Total	44.1	10.2	21.1	160.7	1.0
		Copper, Total	38.5	8.6	26.4	113.3	1.0
		Mercury, Total	0.18	0.02u	0.18	101.1	1.0
		Magnesium, Total	5690	2360	2640	126.2	1.0
		Manganese, Total	394	217	52.8	333.5*	1.0
		Molybdenum, Total	97.4	0.72	106	91.5	1.0
		Nickel, Total	65.4	10.9	52.8	103.2	1.0
		Lead, Total	56.6	2.0	52.8	103.4	1.0
		Selenium, Total	197	0.37u	211	93.5	1.0
		Vanadium, Total	82.5	19.6	52.8	119.1	1.0
		Zinc, Total	87.4	21.8	52.8	124.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B14KC7	Silver, Total	0.05u	0.05u	NC	1.0
		Arsenic, Total	0.57	0.60	5.0	1.0
		Boron, Total	0.15u	0.15u	NC	1.0
		Barium, Total	53.9	40.6	28.1	1.0
		Beryllium, Total	0.29	0.28	0.60	1.0
		Cadmium, Total	0.03u	0.03u	NC	1.0
		Chromium, Total	10.2	15.6	41.9	1.0
		Copper, Total	8.6	7.7	11.0	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Magnesium, Total	2360	2380	0.66	1.0
		Manganese, Total	217	218	0.46	1.0
		Molybdenum, Total	0.72	0.51	35.4	1.0
		Nickel, Total	10.9	12.9	16.8	1.0
		Lead, Total	2.0	2.1	4.9	1.0
		Selenium, Total	0.37u	0.37u	NC	1.0
		Vanadium, Total	19.6	18.4	6.3	1.0
		Zinc, Total	21.8	21.1	3.3	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	02L0299-LC1	Silver, LCS	48.6	50.0	MG/KG	97.2
		Arsenic, LCS	930	1000	MG/KG	93.0
		Boron, LCS	467	500	MG/KG	93.5
		Barium, LCS	497	500	MG/KG	99.3
		Beryllium, LCS	24.2	25.0	MG/KG	96.8
		Cadmium, LCS	24.6	25.0	MG/KG	98.4
		Chromium, LCS	50.1	50.0	MG/KG	100.2
		Copper, LCS	124	125	MG/KG	99.6
		Magnesium, LCS	2450	2500	MG/KG	97.8
		Manganese, LCS	76.8	75.0	MG/KG	102.4
		Molybdenum, LCS	494	500	MG/KG	98.9
		Nickel, LCS	198	200	MG/KG	98.8
		Lead, LCS	246	250	MG/KG	98.2
		Selenium, LCS	899	1000	MG/KG	89.9
		Vanadium, LCS	254	250	MG/KG	101.5
		Zinc, LCS	96.5	100	MG/KG	96.5
LCS1	02C0159-LC1	Mercury, LCS	2.5	2.5	MG/KG	101.6

Lionville Laboratory Use Only

0205L734

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC.

13

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client HANFORD SAF# B02-050

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 5-22-02 Date Due 6-21-02

	A	B	C				D	E		F	G			
Refrigerator #	1	6	6				6	6		6	6			
#/Type Container Liquid														
#/Type Container Solid	1AG	1AG	1AG				1PL	1AG		1AG	1AG	→		
Volume Liquid														
Volume Solid	250	250	250				L	250		120	120	→		
Preservatives	—	—	—				—	—		—	—	→		
ANALYSES REQUESTED →	VOA	BNA	~~Pest~~ PCB	Herb			IC ANION	Metal	CN	Hex CHROM	TPH Diesel Fuel	WTPH D TPH GASOLINE Fuel	WTPH G	

Lionville Laboratory Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624N	0625X	0PCB				INORG①	MET①		ICR6	ODRO	OGRO			
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1				1	1		1	1	/	/	/	

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Special Instructions: SAF # B02-050

DATE/REVISIONS:
MET① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni
2. V, Zn.
INORG① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 790529371090

Bechtel Hanford Inc. — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-050-27 | Page 1 of 1

Collector FAHLBERG	**Company Contact** D JACQUES	**Telephone No.** 372-9651	**Project Coordinator** TRENT, SJ
Project Designation 216-Z-11 Ditch Borehole Samples	**Sampling Location** 200 W		**SAF No.** B02-050
Ice Chest No. SEE OSPC	**Field Logbook No.** EL 1517 • 3	**COA** B20CW5674C	**Method of Shipment** Fed EX
Shipped To TMA/RECRA	**Offsite Property No.** AØ 20139		**Bill of Lading/Air Bill No.** SEE OSPC

Price Code 8N — **Data Turnaround** 45 Days — **Air Quality** ☐

POSSIBLE SAMPLE HAZARDS/REMARKS RT 5.21.02

Tie to B14LK4

Special Handling and/or Storage

None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to

Sample No.	Matrix *	Sample Date	Sample Time										
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

Personnel not available to relinquish samples from the 3728 Ref # 2A on 5/21/02 RT

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg	1105 5.17.02	Ref 2A	1105 5.17.02
Ref 2A 3728	5.21.02 1000	R. Thoren	5.21.02 1000
R. Thoren	5.21.02 1000 EDC	FED EX	
FedEx	5-22-02 1000	[illegible]	5-22-02 1000

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)

(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030

(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}

(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}

~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium - H3; Isotopic Uranium (6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

DATE: 5-22-02

Purchase Order/Project:

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205C734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☐ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian: Kelli Kennedy

Laboratory Project Manager:

SAMPLE DIGESTION RECORD

SOP: L-SPI-3020 Rev. 00

Digestion Batch #: 020299
Date/Time Initiated: 06/09/02
Date/Time Completed: 06/09/02
Analyst(s): RMP
Matrix: (Soil) Water Other:
Instr. Type: AA (ICP)
Parameters: See Backlog

(Digested) / Undigested (circle one)
Balance #: B-20
Balance Cal Verif: (Y) NA
Hot Plate Temp: 92°

Method: SW (circle)
3005A
3010A
3015
3020A
7060A (As/Se)
7760A (Ag)
(3050B)
3051

DW 200.7 (1994), 200.9, 3113B
MCAWW 200.7 (1982), 200 (AA), 206.2 (As/Se)
SM 3030C (NC)
CLP ILMO3.0, ILMO4.0
Other

BJK, TNG

COC Batch #	Spike Vol(s) (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/So/ TC	Texture	Color/Appearance	Artifact	Turb
0205L620-005		1.01	100	N/A	TOT	Coarse	Brown	Mud	N/A
-005R		1.02							
⊛ -005S	1.0	1.01							
-006		1.03							
0205L665-001		1.04				Fine		Soil	
-001R		1.04							
-001S	1.0	1.04							
-002		1.00							
0205L710-001		1.01				Coarse		Rocks	
-001R		1.01							
-001S		1.01							
0205L734-001		1.05							
-001R		1.06							
-001S	1.0	1.05							
020299-MB1		1.00				N/A	Clear	N/A	
⊛ -LC1	1.0	1.00							

Rhodel
06-09-02

Spiking IDs:
MS #: $100-02-05
-06
-07
6072-48-14
LCS #: 6072-49-05
-06
-07
-08

Reagent IDs:
HNO_3 X140411
HCL H1311 (H.P.)
H_2O_2 52404V37H16
1:1 HNO_3 8727-025-02
1:1 HCL

File ID#: IC029901 IC029902
LIMS Transfer: (Y) N
Data Review By/Date: Updated

⊛ Also spiked 0.5 ml of 4- (6072-047-04)
RMP 6-09-02

Lionville Laboratory Incorporated

MERCURY PREPARATION

Logbook # 8979

Analyst: [signature]
Date 6/6/02
Start Time/Temp: 1915/19.5°C
End Time/Temp: 1945/19.8°C

Instrument ID Hg1.1
Balance #: B29 /NA
Pipette Calibration (Daily) (Y) ___

Prep Batch: 020159
Worksheet: HG060711
OP No. ME-7470A, Rev. 00

pH < 2 for Liquids? __ Yes N/A No (If no: designate affected samples in Comments column, and initiate an SDR)

NOTE: **The Initial/Final Volume for water samples = 33mL, unless otherwise noted.**
The Final volume for soil samples = 50mL, unless otherwise noted.

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
Blank	516			10ml	50ml	
0.2 ug/L	DLD	0.100				
1.0 ug/L	702	0.500				
2.0 ug/L	50	1.000				
5.0 ug/L	28	2.500				
10.0 ug/L	301	5.000				
ICV	761	0.126	2.5			
CCV	1435	0.250	5.0			
ICB/CCB	210/505			↓		% solids
MB1	910			0.30gm		MB5159 100.00
LCS	207	*	*	0.19gm		LCSWS159 ↓
0206L866-001 A	56			0.32gm		MW 6/6/02 49.41
001R	K112			0.31gm		↓
001S	750	0.500	1.0	0.33gm		
002	812			0.31gm		83.89
0205L710-001 B	116			0.31gm		97.39
001R	80			0.30gm		↓
001S	214	0.500	1.0	0.31gm		
0205L734-001	77			0.31gm		90.19
001R	32			0.34gm		↓
001S	810	0.500	1.0	0.31gm		
0205L735-001 ↓	204			0.39gm	↓	95.50

Standard:	ID	Prep Date/Time
ICAL/MS	EM-E032B06U2	6/6/02 1730
CCV/CCV/LCS	US-US08A06U6	↓

Reviewed By/Date:

See book # 4520 for std traceability information

* Soil LCS = ERA Metals in soil; True Value = 2.48 mg/Kg
Catalogue # 540, Lot # 245

Water Matrix Spiking Solution Concentration= 0.1µg/ml
Water LCS Spiking Concentration: 1.0µg/ml

Lionville Laboratory Incorporated

MERCURY PREPARATION

Logbook # 8979

Analyst: [signature]
Date 6/6/02
Start Time/Temp: 1039/0140
End Time/Temp:

Instrument ID Hg-1
Balance #: B29 /NA
Pipette Calibration (Daily) ✓ ___

Prep Batch: 020159
Worksheet: H006071
OP No. ME-7470A, Rev. 00

pH < 2 for Liquids? __ Yes N/A No (If no: designate affected samples in Comments column, and initiate an SDR)

NOTE: The Initial/Final Volume for water samples = 33mL, unless otherwise noted.
The Final volume for soil samples = 50mL, unless otherwise noted.

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
02052735-001R B	A86			0.35gm	50ml	95.50
001S ↓	325	0.500	1.0	0.40gm	↓	↓
002 A	801			0.33gm		96.58
02052757-001 C	95			0.36gm		RAD 100.00
02052758-001 B	A31			0.33gm	↓	↓

AA 6/6/02

Standard:	ID	Prep Date/Time
ICAL/MS		
MO/CCV/LCS	See page 014B	

Reviewed By/Date: _____

See book # 4527 for std traceability information

Soil LCS = ERA Metals in soil; True Value = 2.48 mg/Kg
Catalogue # 540, Lot # 245

Water Matrix Spiking Solution Concentration= 0.1µg/ml
Water LCS Spiking Concentration: 1.0µg/ml

ME-7470A-C-0801

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7						
% SOLIDS	001	S	02L%S054	05/17/02	05/29/02	05/30/02
% SOLIDS	001 REP	S	02L%S054	05/17/02	05/29/02	05/30/02
FLUORIDE BY IC	001	S	02LICB40	05/17/02	06/07/02	06/07/02
FLUORIDE BY IC	001 REP	S	02LICB40	05/17/02	06/07/02	06/07/02
FLUORIDE BY IC	001 MS	S	02LICB40	05/17/02	06/07/02	06/07/02
NITRATE BY IC	001	S	02LICB40	05/17/02	06/07/02	06/07/02
NITRATE BY IC	001 REP	S	02LICB40	05/17/02	06/07/02	06/07/02
NITRATE BY IC	001 MS	S	02LICB40	05/17/02	06/07/02	06/07/02
CHROMIUM VI	001	S	02LVI017	05/17/02	06/10/02	06/10/02
CHROMIUM VI	001 REP	S	02LVI017	05/17/02	06/10/02	06/10/02
CHROMIUM VI	001 MS	S	02LVI017	05/17/02	06/10/02	06/10/02
CHROMIUM VI	001 MSD	S	02LVI017	05/17/02	06/10/02	06/10/02
SULFATE BY IC	001	S	02LICB40	05/17/02	06/07/02	06/07/02
SULFATE BY IC	001 REP	S	02LICB40	05/17/02	06/07/02	06/07/02
SULFATE BY IC	001 MS	S	02LICB40	05/17/02	06/07/02	06/07/02
NITRATE NITRITE	001	S	02LN3C34	05/17/02	06/12/02	06/12/02
NITRATE NITRITE	001 REP	S	02LN3C34	05/17/02	06/12/02	06/12/02
NITRATE NITRITE	001 MS	S	02LN3C34	05/17/02	06/12/02	06/12/02
AMMONIA	001	S	02LAMA16	05/17/02	06/10/02	06/10/02
AMMONIA	001 REP	S	02LAMA16	05/17/02	06/10/02	06/10/02
AMMONIA	001 MS	S	02LAMA16	05/17/02	06/10/02	06/10/02
SULFIDE	001	S	02LSDA19	05/17/02	05/22/02	05/22/02
SULFIDE	001 REP	S	02LSDA19	05/17/02	05/22/02	05/22/02
SULFIDE	001 MS	S	02LSDA19	05/17/02	05/22/02	05/22/02
LAB QC:						
FLUORIDE BY IC	MB1	S	02LICB40	N/A	06/07/02	06/07/02
FLUORIDE BY IC	MB1 BS	S	02LICB40	N/A	06/07/02	06/07/02
NITRATE BY IC	MB1	S	02LICB40	N/A	06/07/02	06/07/02
NITRATE BY IC	MB1 BS	S	02LICB40	N/A	06/07/02	06/07/02
CHROMIUM VI	MB1	S	02LVI017	N/A	06/10/02	06/10/02
CHROMIUM VI	MB1 BS	S	02LVI017	N/A	06/10/02	06/10/02
CHROMIUM VI	MB1 BSD	S	02LVI017	N/A	06/10/02	06/10/02
SULFATE BY IC	MB1	S	02LICB40	N/A	06/07/02	06/07/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFATE BY IC	MB1 BS	S	02LICB40	N/A	06/07/02	06/07/02
NITRATE NITRITE	MB1	S	02LN3C34	N/A	06/12/02	06/12/02
NITRATE NITRITE	MB1 BS	S	02LN3C34	N/A	06/12/02	06/12/02
AMMONIA	MB1	S	02LAMA16	N/A	06/10/02	06/10/02
AMMONIA	MB1 BS	S	02LAMA16	N/A	06/10/02	06/10/02
AMMONIA	MB1 BSD	S	02LAMA16	N/A	06/10/02	06/10/02
SULFIDE	MB1	S	02LSDA19	N/A	05/22/02	05/22/02
SULFIDE	MB1 BS	S	02LSDA19	N/A	05/22/02	05/22/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-050 H1788
LVL#: 0205L734

W.O.#: 11343-606-001-9999-00
Date Received: 05-22-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries for Fluoride, Nitrate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 75-125% control limits.

8. The replicate analyses for Percent Solids, Fluoride, Nitrate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

06-28-02
Date

njp\i05-734

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	√ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		√ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		√ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	
Other: Fluoride, Nitrate, Sulfate		**Method:** EPA 300.0 (MOD.)	
Other: Nitrate Nitrite		**Method** EPA 353.2 (MOD.)	
Ammonia		EPA 350.3 (MOD.)	

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B14KC7	% Solids	90.2	%	0.01	1.0
		Fluoride by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	2.38	MG/KG	1.39	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	3.8	MG/KG	1.4	1.0
		Nitrate Nitrite	0.70	MG/KG	0.20	1.0
		Ammonia, as N	69.5	MG/KG	3.3	1.0
		Sulfide	22.6 u	MG/KG	22.6	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	02LICB40-MB1	Fluoride by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	02LVI017-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	02LN3C34-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	02LAMA16-MB1	Ammonia, as N	2.5	u	MG/KG	2.5	1.0
BLANK10	02LSDA19-MB1	Sulfide	40.0	u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B14KC7	Fluoride by IC	29.0	0.0	28.0	103.8	1.0
		Nitrate by IC	29.9	2.38	28.0	98.2	1.0
		Soluble Chromium VI	4.8	0.44u	4.4	103.4	1.0
		Insoluble Chromium VI	1210	0.44u	1000	121.5	100
		Sulfate by IC	31.3	3.8	28.0	98.0	1.0
		Nitrate Nitrite	6.2	0.70	5.4	102.9	1.0
		Ammonia, as N	281	69.5	181	116.8	1.0
		Sulfide	153	9.0	174	83.1	1.0
BLANK10	02LICB40-MB1	Fluoride by IC	26.6	1.2 u	25.0	106.6	1.0
		Nitrate by IC	24.4	1.25u	25.0	97.8	1.0
		Sulfate by IC	24.6	1.2 u	25.0	98.6	1.0
BLANK10	02LVI017-MB1	Soluble Chromium VI	4.1	0.40u	4.0	101.9	1.0
		Insoluble Chromium VI	1090	0.40u	966	113.3	100
BLANK10	02LN3C34-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.8	1.0
BLANK10	02LAMA16-MB1	Ammonia, as N	105	2.5 u	100	105.0	1.0
		Ammonia, as N MSD	97.5	2.5 u	100	97.5	1.0
BLANK10	02LSDA19-MB1	Sulfide	302	40.0 u	320	94.6	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	02LAMA16-MB1	Ammonia, as N	105.0	97.5	7.4

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B14KC7	% Solids	90.2	90.4	0.18	1.0
		Fluoride by IC	1.4 u	1.4 u	NC	1.0
		Nitrate by IC	2.38	2.34	1.4	1.0
		Chromium VI	0.44u	0.44u	NC	1.0
		Sulfate by IC	3.8	3.5	9.7	1.0
		Nitrate Nitrite	0.70	0.83	17.4	1.0
		Ammonia, as N	69.5	75.7	8.6	1.0
		Sulfide	22.6 u	31.1 u	NC	1.0

Lionville Laboratory Use Only

0205L734

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

TNU-Hanford

Client HANFORD SAF# B02-050

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 5-22-02 Date Due 6-21-02

	A	B	C				D	E		F	G			
Refrigerator #	1	6	6				6	6		6	6			
#/Type Container Liquid														
#/Type Container Solid	1AG	1AG	1AG				1PL	1AG		1AG	1AG	→		
Volume Liquid														
Volume Solid	250	250	250				L	250		120	120	→		
Preservatives	—	—	—				—	—		—	—	→		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	PCB	Herb			IC Anion	INORG: Metal	CN	Hex Chrom	TPH Diesel Conf	WTPH-D TPH Gasoline Forge	STPH G	
Lionville Laboratory Use Only	0624N	0625X	OPCB				INORG ①	MET ①		ICR6	ODRO	OGRO		

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	PCB				IC Anion	Metal	CN	Hex Chrom	TPH Diesel	WTPH	STPH	
001	B14KC7	✓	✓	S	5-17-02	1105	1	1	1				1	1		1	1	/	/	/

Special Instructions: SAF # B02-050

DATE/REVISIONS:

MET① 1. RCRA + Be, B, Cu, Mg, Mn, Mo, Ni,
2. V, Zn.
INORG① 3. ICFL, ICNO3, ICSO4, INH3N, IN3N2, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	5/22/02	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
790529371090

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-050-27	Page 1 of 1

Collector FAHLBERG	**Company Contact** D JACQUES	**Telephone No.** 372-9651	**Project Coordinator** TRENT, SJ	**Price Code** 8N	**Data Turnaround** 45 Days
Project Designation 216-Z-11 Ditch Borehole Samples	**Sampling Location** 200 W		**SAF No.** B02-050	**Air Quality** ☐	
Ice Chest No. SEE OSPC	**Field Logbook No.** EL 1517 - 3	**COA** B20CW5674C	**Method of Shipment** Fed EX		
Shipped To TMA (RECRA)	**Offsite Property No.** HO 20139		**Bill of Lading/Air Bill No.** SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS RTS 5.21.02

Tie to B14LK4

Special Handling and/or Storage

None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container	aG	aG	P	aG	aG	aG	aG	P	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	120mL	1000mL	250mL	250mL	250mL	120mL	1000mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs - 8082	See item (3) in Special Instructions.	See item (4) in Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to
Sample No.	Matrix *	Sample Date	Sample Time							
B14KC7	SOIL	5.17.02	1105	X	X	X	X	X	X	X			B14LK4

RT 5.21.02

Personnel not available to relinquish samples from the 3728 Ref # 2A on 5/21/02

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1105	Received By/Stored In	Date/Time 1105
R. Fahlberg	5-17-02	Ref 2-A	5-17-02
Relinquished By/Removed From	Date/Time 0000	Received By/Stored In	Date/Time 0000
Ref 2A 3728	5.21.02	R T Thoren	5.21.02
Relinquished By/Removed From	Date/Time 0000	Received By/Stored In	Date/Time
R T Thoren	5.21.02 ERC	FEDEX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FedEx	5-22-02 1000	V. Hernandez	5-22-02 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

See SAF

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Sulfides - 9030
(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App IX Add-On) {Tetrahydrofuran}
(4) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, Tributyl phosphate}
~~(5) Gamma Spec - Complete {Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}; Isotopic Thorium {Thorium-232}; Carbon-14; Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Tritium - H3; Isotopic Uranium~~
~~(6) Isotopic Plutonium, Americium-241/Curium-244 {Americium-241}, Americium-241/Curium-244 (Add-on) {Curium-243}~~

RT 5.21.02

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22-02

SAF# / SOW# / Release #: B02-050

Laboratory SDG #: J205L734

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp and Comments:

02-0004 22°C

Laboratory Sample Custodian: Keith Kennedy

Laboratory Project Manager: